Extension Folder 74 June 1939

Care and Feeding of the Dairy Calf

T. W. Gullickson

GOOD herds can be built and maintained only from well-bred, properly developed calves. For this reason it is important to select healthy, strong, vigorous calves to raise. Unless it is valuable because of its breeding, do not bother to raise a calf that is ailing at birth. Although a calf large at birth for the breed is desirable, vigor and thriftiness are more important.

Successful calf raising is a comparatively simple task on dairy farms where fresh skim milk or skim milk powder is available for feeding. Good results are assured if a few simple rules are observed. Feed whole milk during the first few weeks to assure the calf a good start, then change gradually to skim milk, either fresh or reconstituted from skim milk powder. Feed grain and hay as soon as the calf will eat them.

Good Care at Birth Is Important

The first few weeks after birth are a critical period. Most of the troubles in calf raising come from improper care and feeding during this time. Observance of the ordinary rules of health in its feeding and care is about all that is necessary. Provide the cow with a clean, warm, well-bedded box stall in which to calve. After the calf is born, let the mother lick it dry; if she fails to do this, wipe it with straw until dry. To guard against the entrance of disease through the navel, press out the jelly-like substance in the cord and thoroughly disinfect the navel stump with tincture of iodine or some other standard disinfectant. Protect the calf against exposure to drafts.

The calf should receive some of the colostrum or "first milk." It acts as a laxative and also gives temporary protection against various calf diseases. Normally a calf will get up and begin nursing within an hour after birth. Occasionally a weak calf may have to be held up to nurse at first. In case the calf cannot receive the colostrum milk owing to the presence of disease in the mother, give it a teaspoonful of castor oil every three hours until there is a bowel movement, and feed two or three raw eggs daily along with the whole milk during the first four or five days.

The calf can be removed from its mother after it has nursed a few times. The sooner it is removed, the easier it will be to teach it to drink.

Avoid Overfeeding

Feed regularly with milk fresh from the cow. Keep feed buckets and mangers scrupulously clean. Be careful not to feed too much milk. Probably more calves die from indigestion or scours caused by overfeeding of milk than from any other single cause. Determine carefully, by measuring or weighing, the amount of milk fed. A spring scale, like that used to weigh the milk of each cow in the herd, will be found most satisfactory. A safe rule is to feed not over one pound of milk for each 10 pounds of weight of calf. Thus a calf weighing 80 pounds should be fed not over 8 pounds of milk per day, at the rate of two quarts at each of the usual two feedings.

High-fat milk will usually give better results if diluted one third with skim milk or warm water. Regularity, cleanliness, and care in the amount and temperature of milk fed mean thrifty calves.

When to Begin Skim Milk Feeding

Begin replacing the whole milk with skim milk when the calf is about two weeks old. Substitute one pound of skim milk for one of whole milk at each feeding until the change is completed.

Feed the skim milk immediately after separation, as it is then fresh and sweet and the temperature is approximately the same from day to day. Creamery skim milk is not so desirable because it is less uniform in quality and may also serve as a carrier of disease. When used, it should always be fed at a uniform temperature (usually about 90 degrees). Feeding calves on sour milk is not harmful (good calves can be raised on it), but to obtain good results it must always be uniform.

Continue to feed skim milk until the calf is six months old, or longer if the supply is plentiful. Increase it to a maximum of 18 pounds daily as the calf grows.

Skim Milk and Buttermilk Powder Can Replace Skim Milk

When whole milk is sold, calves can be successfully raised using reconstituted skim milk made from skim milk powder. One pound of the powder mixed with nine pounds of warm water makes skim milk. Mix with only enough water to form a thick paste, then add remainder of water. It should be mixed fresh at each feeding. Buttermilk powder can be used in place of skim milk powder when it is cheaper.

These products are fed in exactly the same way as fresh skim milk, except that a little more care is needed when changing to the powdered milk ration. This is especially true of buttermilk powder as it is laxative.

The use of powder allows weaning at an early age, as the powder can be mixed in the grain ration as soon as the calves are eating a good quantity of grain at four to six weeks of age. A good mixture for this purpose is made up of 400 pounds ground corn, 100 pounds wheat bran, 200 pounds skim milk powder, 10.5 pounds bone meal, and 7 pounds salt.

At eight to ten weeks of age, half of the milk powder in the mixture can be replaced by an equal amount of linseed meal. The skim

milk powder may be discontinued entirely at four to five months, or a little earlier if the calves are getting a good legume roughage.

Hay and Grain Feeding

Hay is extremely important in the diet of the calf for it is the chief or only source of vitamins A and D, as well as other essential factors lacking or deficient in the remainder of the ration. The calf should be eating hay and grain before it is changed to skim milk. Calves fed little or no hay become unthrifty and fail to grow normally. If possible, feed only good-quality sun-cured hay. Good-quality clover hay is probably the best for calves; alfalfa is too laxative at times. Timothy and other grass hays are satisfactory when supplemented by proper grain feeding. Feed a grass hay in place of legume hay to calves suffering from scours. Calves consume more hay when it is fed often in small amounts; they do not like to eat feed that has been nosed over.

When hay feeding begins, teach the calf to eat grain by rubbing some dry meal on its muzzle after feeding milk. It will taste the grain and soon learn to eat it from the feed box. Never feed grain mixed with the milk as it may cause digestive troubles. The pails must be washed daily. The calf will prefer grain that is rather coarsely ground. Until weaned, feed the calf all the grain it will eat, up to three pounds a day.

Skim milk is rich in protein. The grain mixture, therefore, may be made up of any combination of low-protein, home-grown cereals such as corn, oats, and barley. However, a small amount of bran or linseed meal makes it more palatable. The use of bran with a non-legume hay is especially important; in the phosphorus-deficient area it should be used because of its high phosphorus content. The following grain mixtures give good results:

Mixture 1:	300 lbs. cornmeal
	100 lbs. ground oats or barley
	6 lbs. bone meal
	4 lbs. salt
Mixture 2:	300 lbs. cornmeal
	100 lbs. wheat bran
	6 lbs. bone meal
	4 lbs. salt
Mixture 3:	200 lbs. ground oats
	100 lbs. ground barley
	100 lbs. wheat bran
	6 lbs. bone meal
	4 lbs. salt

A feeding schedule for raising calves on skim milk during the first 180 days or six months is given in table 1.

Table 1. Daily Feeding Schedule for First 180 Days

Age, days	Whole milk, pounds	Skim milk or reconstituted skim milk	Clover or alfalfa hay, pounds	Grain mixture, pounds
1-3	Leave with its mother			
3-14	8-10	.....	All hay and grain it will eat.	
14-20	10-11	1-12	All hay and grain it will eat.	
21-60	.....	12-14	All hay and grain it will eat.	
61-120	.....	14-16	All hay it will eat.	1.5 to 2.0
121-180	.....	16-18	All hay it will eat.	2.0 to 3.0

Good Care as Important as Proper Feeding

Good care and management is equal in importance to the feed a calf receives. Experience shows that all the benefits of proper feeding may be lost through faulty management. There are no hard-and-fast rules that can be applied in the management of the calf; it is not so simple as that. The following suggestions may help.

When the calf is removed from its mother, keep it in a small clean pen by itself for a few days if possible. It may then be placed in a larger pen with other calves of about the same age.

The pens should be located where there is an abundance of sunlight and fresh air. They should always be kept clean, dry, and well bedded. Wet, filthy quarters are responsible for many troubles in calf raising. Allow at least 25 square feet of floor space for each animal. When crowded, animals require more care and do not thrive.

Good ventilation is necessary, for calves thrive best in a rather cool dry barn, free from drafts. Damp, drafty quarters are responsible for most of the cases of pneumonia in calves. To provide good ventilation without drafts, use frames covered with unbleached muslin rather than muslin. This method has been used during winter temperatures as low as 25 degrees below zero and all calves remained healthy and thrifty.

Provide a rack that will hold enough hay for one day for all the calves in the pen. In larger pens, build stanchions along one side to insure each calf receiving its proper ration. A simple, inexpensive stanchion may be constructed from boards. It is well to make the stanchions of several widths to fit various sizes of calves. By leaving calves in stanchions and feeding grain immediately after the milk is fed, the calves may be prevented from sucking one another.

During the first four months of its life, feed the calf its entire ration in the barn, but allow it to exercise out of doors several hours daily when the weather permits. Calves should not be turned on pasture before six months of age, because pasture grass is too bulky for the stomach of the calf. Exposing a calf to wind and weather and to the torment of flies causes unthriftiness. When the calf is old enough to be turned on pasture, make the change gradually by limiting the time on pasture each day and feeding part of the regular ration in the barn.

Silage, like pasture grass, should not be fed to calves less than four months old. Limited amounts may be fed to animals beyond this age.

Feeding and Care After Weaning

Usually skim milk is fed until the calf is six months old. However, when the supply is plentiful, its feeding may be continued to advantage indefinitely, especially when no legume hay is being fed. After weaning, increase the amount of grain fed several pounds to supply nutrients to replace those previously provided in the milk. Too often the grain ration is also cut off at this time and the calf left to shift for itself. This is one of the chief causes of runty and undersized cows on many dairy farms.

When good legume hay or pasture is fed, feed the same grain mixture as before weaning, but with a low-protein roughage such as timothy hay or poor pasture add 10 per cent of some high-protein feed to the mixture.

When calves are receiving good legume hay or are on pasture and have completely recovered from shock of weaning, gradually reduce the amount of grain fed until it is eliminated entirely from the ration at the age of about one year. From this age until a few months before freshening, good-quality legume hay, with or without silage in winter, and good pasture in summer will supply all that is necessary to promote growth and normal development in the heifer. Feeding some grain during this period, however, will usually result in more rapid growth and earlier maturity.

Water and Salt

Give calves access to a supply of fresh, clean water at all times. They need water even when fed milk. Likewise, place a supply of clean salt where they can get at it.

Minerals and Vitamins

Calves, like other animals, must depend almost entirely on the rations fed to supply them with the vitamins and minerals required. Under certain conditions, a shortage or deficiency in the diet in one or more of these may occur. There is, however, slight danger of this if calves are fed as outlined in this folder.

Of the minerals, calcium, phosphorus, sodium, chlorine, and iodine are the only ones likely to be deficient. Only two of the known vitamins, A and D, appear likely ever to be deficient in the rations of calves.

All roughage, but especially legume hay, provides an abundant supply of calcium, as well as some phosphorus. Good roughage is also a rich source of vitamins A and D. Concentrates, on the other hand, are rich in phosphorus and low in calcium and are almost lacking as a source of vitamins A and D. As calves should always have free access to salt, there should be no lack of sodium and chlorine.

If calves show a lack of appetite for good-quality hay or a craving to chew on old bones or boards, a phosphorus deficiency is indicated. Similarly, a calcium shortage is suggested when animals lick or eat soil. In either case, the deficiency will be corrected by feeding bone meal mixed in the grain mixture at the rate of 1.5 pounds per hundred pounds of grain.

When calves are born with goiter or "big neck," a deficiency of iodine in the diet of the mother is indicated. On farms where this occurs, iodized salt should always be fed to the herd. A homemade remedy can be prepared by mixing one ounce of either pulverized potassium or sodium iodide with 200 pounds of salt.

When calves are born blind or fail to thrive and grow without any apparent cause, a vitamin A deficiency in the mother's ration is suggested. It may occur if cows have been fed only a limited amount of hay or if the hay was of poor quality and lacking in green coloring. Green grass or good-quality leafy green hay will pre-

vent the difficulty. Affected calves too young to eat hay should be fed two tablespoonfuls daily of cod-liver oil.

A vitamin D deficiency may occur during winter or whenever calves are kept indoors and fed mostly on concentrates and poor-quality roughage. Typical symptoms are stiffness, arched back, bent knees, swollen hocks, and lack of appetite for grain. Plenty of vitamin D will be supplied by feeding good-quality sun-cured hay or by putting the calves out in the sunshine a part of the day. Cod-liver oil fed as directed above will also supply the vitamin D needed when good hay is not available.

Marking Calves

Every calf raised in the herd should be given a number or mark of identification which should be carefully recorded in the herd book. Depending on memory alone for identification results in frequent mistakes.

Several methods of marking are used. The most satisfactory are the eartag and tattooing. The eartags bear numbers and may also carry the name and address of the owner. This method is simple and inexpensive. Tattoo marks in the ear, if properly done, leave a permanent mark of identification. They are required by some of the breed associations.

Early Dehorning Is Advisable

All animals in the herd should be dehorned. Cows with horns are responsible for considerable losses each year to the farmer in the way of injured udders. The easiest and most humane way of dehorning is to prevent the horns from growing by applying caustic soda or potash to the horn buttons before the calf is a week old. The stick of caustic should always be wrapped in paper to protect the hands. The hair should be clipped from the horn buttons, the end of the stick of caustic moistened slightly, and the tip rubbed on the horn buttons. This should be done two or three times, allowing the caustic to dry after each application. Care should be taken to apply the caustic, which should not be too moist, only to the horn buttons. For a few days after the application, the calf should be protected from rain or moisture. By keeping its head dry, the caustic will be prevented from spreading.

UNIVERSITY FARM, ST. PAUL, MINNESOTA

Cooperative Extension Work in Agriculture and Home Economics, University of Minnesota, Agricultural Extension Division and United States Department of Agriculture Cooperating, P. E. Miller, Director. Published in furtherance of Agricultural Extension Acts of May 8 and June 30, 1914. 20M-6-39